

corded from *Lippia lanceolata* and *L. nodiflora* (Verbenaceae) (Kimball, 1965, Arthropods of Florida and Neighboring Land Areas, Vol. 1, Lepidoptera of Florida, Florida Dept. Ag.), *Lysimachia* sp. (Primulaceae) (Harris, 1972, Butterflies of Georgia, Univ. of Oklahoma Press), and *Eriogonum* sp. (Polygonaceae) (Tietz, *ibid.*).

In Missouri, *C. g. carlota* larvae have been recorded from *Helianthus annuus* L. (Compositae) (J. R. Heitzman, pers. comm.) and *Linaria vulgaris* Hill (Scrophulariaceae) (Masters, 1969, J. Kansas Entomol. Soc. 42(2):133-144). Here I report giant ragweed, *Ambrosia trifida* L. (Compositae), as a new food plant for *C. g. carlota*. *A. trifida* L. is an annual, monoecious weed common to fertile moist soils, bottom lands, alluvium, and waste places.

On 9 August 1977, while collecting along a roadside bank of State Rt. 10 (3.2 km west of Richmond, MO), I found thirteen larvae that were unfamiliar to me on the leaves of three separate giant ragweed plants. Due to the uniformity in larval size and the close proximity of the plants to each other (within 0.5 m of each other), the infestation was probably the result of a single oviposition. The thirteen larvae, along with an ample supply of the food plant, were collected and taken to my home to be reared. Six larvae were preserved on 9 August 1977; the remaining seven larvae were allowed to feed. On 10 August 1977 one larva pupated, emerging 11 days later. The single adult, identified as a female *C. g. carlota* by J. R. Heitzman, is slightly smaller and darker than the typical female of the species (Figs. 1-4), which may have resulted from the rearing. The six remaining larvae pupated on 11 August 1977 and were preserved.

I am especially grateful to J. Richard Heitzman for identifying the specimen and for reviewing this manuscript. Thanks are also extended to Dr. Charles V. Covell, Jr., Dr. Stephen Clement and to Ms. Candy Fogg for their critical reviews and to Mr. Glenn Berkey of the Ohio Agricultural Research and Development Center, Wooster, for the photographs.

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Journal of the Lepidopterists' Society
37(1), 1983, 81-82

A NATURAL OCCURRENCE OF INTER-TRIBAL COPULATION IN THE PAPILIONIDAE

Among the Lepidoptera numerous prezygotic isolating mechanisms (Mayr, 1970, Population, Species and Evolution, Belknap Press, Cambridge, MA) operate to prevent interspecific mating. At times, however, these isolating mechanisms appear to break down. While breakdowns occur rarely between closely related species, breakdowns between distantly related and phenotypically distinct species are quite exceptional. A salient example of such a breakdown was observed on 15 April 1980 in the Kirby State Forest near Kountze, Tyler County, Texas.

Swallowtail diversity in Kirby Forest and throughout the upland savannah of south-east Texas is high; at least six different species are resident (Rausher, in preparation). *Eurytides marcellus* (Papilionidae: Graphiini) and *Battus philenor* (Papilionidae: Troilini) fly sympatrically in the open pine uplands. The two species are temporally synchronous, adults flying commonly between mid-March and mid-April. During this period females spend much of their time searching among the herbaceous vegetation for larval food plants. For *B. philenor*, these are *Aristolochia reticulata* and *A. serpentaria*, small erect perennial herbs in the family Aristolochiaceae (Rausher, 1978, Science 200: 1071-1073). The larval food plant of *E. marcellus*, in contrast, is *Asimina parviflora*, an annonaceous shrub that grows in east Texas to a maximum height of 2-3 ft. Males of each species fly through the pine uplands, approach females while they are ovipos-



FIG. 1. Female *Battus philenor* and male *Eurytides marcellus* photographed in copulo in Kirby Forest, southeast Texas.

iting or nectaring, and engage in precopulatory courtship flights. Although males of either species may approach heterospecific individuals, such encounters are usually brief in duration. In seven years of observation we have never seen a male engage in persistent courtship of a heterospecific female, although we have observed hundreds of conspecific courtships.

A female *B. philenor* and male *E. marcellus* (Fig. 1) were found resting in copulo among the forest herbs in Kirby Forest. After the pair had disengaged, the female was captured and offered foliage of both species of *Aristolochia* on which to oviposit. She failed to lay eggs on either species over a period of three days. Subsequent dissection of the female revealed no spermatophore in the bursa copulatrix, although many developed chorionated eggs were present. These observations suggest that, despite the fact that the two individuals remained in copulo for more than 30 minutes, no sperm transfer occurred.

Since little is known about the courtship and mating behavior of either butterfly species, it is difficult even to speculate about the events that gave rise to this unusual pairing. Nevertheless, despite the apparent breakdown of ethological isolating mechanisms in this instance, reproductive isolation was maintained by failure of the male to transfer sperm. Whether this failure was due to active interference by the female or simply to the absence of an appropriate cue necessary for triggering sperm transfer is not known.

We thank M. Nijhout for dissecting the female butterfly and Paul Feeny for bringing the east Texas habitat and swallowtails to our attention. This work was supported in part by N.S.F. grant DEB 8016414 to MDR.

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